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U. S. Department of Agriculture

UNITED STATES DEPARTMENT OF AGRICULTURE

Extension Service

Office of Exhibits

A Summary of the Exhibit.

THERE IS A RELATION BETWEEN CERTAIN  
INSIDE AND OUTSIDE MEASUREMENTS OF  
A COW.

A special exhibit showing a mechanically operated cutout cow.

Specifications.

Floor space required - - width - - - - - 14 feet.

depth - - - - - 9 feet.

Wall space required - - - - - None.

Shipping weight - - - - - 1200 lbs.

Electrical Requirements - - 110 volt A. C. Current  
for 1/8 H. P. Motor.



## THERE IS A RELATION BETWEEN CERTAIN INSIDE AND OUTSIDE MEASUREMENTS OF A COW.

### How It Looks.

This exhibit consists of three panels, the middle one of which shows a cow standing in the doorway of a barn. The figure of the cow is a two-piece cut-out of natural size. The heart and lungs have been painted on it in such a manner as to make it appear that the external coverings of hide, flesh, and bone over that area have been removed. A portion of the heart and lungs is painted on the upper section and a portion appears to be on the lower moving part.

The section carrying the underline, which includes the brisket, abdominal wall, and udder, is so attached to a motor that it is in slow but constant up and down motion, which gives the cow an apparently wide range and constantly changing depth of both fore and rear chest. As the under section is lowered, the depth of body increases and the heart and lungs appear to increase in size. As it is raised, the depth of body is diminished and the heart and lungs appear to become smaller.

The side panels show numerically the correlation between the external and internal chest measurements of a cow and the weight of heart and lungs.

### What It Tells.

The purpose of this exhibit is to show the results of comparing the outside depth, width, and circumference of chest and the internal depth and width of chest cavity, with the weight of heart and lungs. The data given in this exhibit have been obtained from a study of more than 200 cows varying greatly in body



measurements. The following information, giving the coefficient of correlation and the probable error for each of the relationships, is shown on the exhibit:

Coefficient of Correlation	To Weight of Heart	To Weight of Lungs
Of outside depth of fore chest	.4364	.4323
" " " rear	.4569	.4178
" " " fore	.2762	.1996
" " " rear	.2889	.2119
" circumference of fore chest	.4938	.3718
" circumference of rear chest	.4835	.3348
" greatest internal depth of chest	.4265	.3829
" greatest internal width of chest (greatest width at seventh rib)	.3213	.3019

\*plus or minus.



Analysis of the data indicates a fairly definite relationship between circumference of both fore chest and rear chest and weight of heart. The correlation between depth of fore and rear chest and weight of heart is almost equally high. On the contrary, the relationship between width of fore and rear chest and weight of heart is decidedly less significant than that of either circumference or depth. The inside depth of the thoracic cavity also shows a relatively high relation to weight of heart, whereas the inside width shows a much lower relation to weight of heart. The relationship between each of these eight measurements and weight of lungs is similar to, but very slightly lower than, the corresponding coefficient of correlation for heart weight.

It appears that there is a distinctly higher relationship between depth of chest and weight of heart and lungs than between width of chest and weight of heart and lungs. This is true whether the body measurements are taken as external dimensions or as internal diameters of the thoracic cavity. In other words, the depth of chest is more significant than is width of chest as indicating the size of heart and lungs.

The model shows that as the depth of chest increases, the size of heart and lungs becomes greater.

#### Where to Get Information.

For information on this subject write to the U. S. Department of Agriculture, Washington, D. C.